# Series 2000
# Step Pulley Drilling Machine

INSTRUCTION MANUAL

**2:1 Speed Reduction Model - 8 speeds**
**(200, 300, 450, 650, 900, 1250, 1550, 2000 RPM)**

**3:1 Speed Reduction Model - 8 speeds**
**(125, 200, 300, 425, 600, 800, 1025, 1250 RPM)**

The Serial No./Series No. plate is attached to the left side of the machine head casting. Locate this plate and record the Serial No. and Series No. in your manual for future reference.

SERIAL NO. _____

SERIES NO. _____

DATE OF PURCHASE _____

Dated 10-30-85

Part No. 402-06-651-0001

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DELTA

## *WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY.*

As with all machinery there are certain hazards involved with operation and use of the machine. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

This machine was designed for certain applications only. Delta Machinery strongly recommends that this machine NOT be modified and/or used for any application other than for which it was designed. If you have any questions relative to its application DO NOT use the machine until you have written Delta Machinery and we have advised you.

DELTA INTERNATIONAL MACHINERY CORP.
MANAGER OF TECHNICAL SERVICES
246 ALPHA DRIVE
PITTSBURGH, PENNSYLVANIA 15238

# SAFETY RULES FOR ALL TOOLS

1. **FOR YOUR OWN SAFETY,** READ INSTRUCTION MANUAL BEFORE OPERATING THE TOOL. Learn the tool's application and limitations as well as the specific hazards peculiar to it.

2. **KEEP GUARDS IN PLACE** and in working order.

3. **GROUND ALL TOOLS.** If tool is equipped with three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accomodate a two-prong receptacle, the adapter lug must be attached to a known ground. Never remove the third prong.

4. **REMOVE ADJUSTING KEYS AND WRENCHES.** Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it "on".

5. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.

6. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.

7. **KEEP CHILDREN AND VISITORS AWAY.** All children and visitors should be kept a safe distance from work area.

8. **MAKE WORKSHOP CHILDPROOF** - with padlocks, master switches, or by removing starter keys.

9. **DON'T FORCE TOOL.** It will do the job better and be safer at the rate for which it was designed.

10. **USE RIGHT TOOL.** Don't force tool or attachment to do a job for which it was not designed.

11. **WEAR PROPER APPAREL.** No loose clothing, gloves, neckties, rings, bracelets, or other jewelry to get caught in moving parts. Nonslip foot wear is recommended. Wear protective hair covering to contain long hair.

12. **ALWAYS USE SAFETY GLASSES.** Also use face or dust mask if cutting operations is dusty. Everyday eyeglasses only have impact resistant lenses; they are NOT safety glasses.

13. **SECURE WORK.** Use clamps or a vise to hold work when practical. It's safer than using your hand and frees both hands to operate tool.

14. **DON'T OVERREACH.** Keep proper footing and balance at all times.

15. **MAINTAIN TOOLS IN TOP CONDITION.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

16. **DISCONNECT TOOLS** before servicing and when changing accessories such as blades, bits, cutters, etc.

17. **USE RECOMMENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause hazards.

18. **AVOID ACCIDENTAL STARTING.** Make sure switch is in "OFF" position before plugging in power cord.

19. **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.

20. **CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to ensure that it will operate properly and perform its intended function — check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

21. **DIRECTION OF FEED.** Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.

22. **NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF.** Don't leave tool until it comes to a complete stop.

23. **DRUGS, ALCOHOL, MEDICATION.** Do not operate tool while under the influence of drugs, alcohol or any medication.

24. **MAKE SURE TOOL IS DISCONNECTED FROM POWER SUPPLY** while motor is being mounted, connected or reconnected.

# ADDITIONAL SAFETY RULES FOR DRILL PRESSES

1. **BE SURE** drill bit or cutting tool is securely locked in the chuck.

2. **BE SURE** chuck key is removed from the chuck before turning on power.

3. **ADJUST** the table or depth stop to avoid drilling into the table.

4. **SHUT OFF** the power, remove the drill bit or cutting tool, and clean the table before leaving the machine.

5. **CAUTION:** When pratical, use clamps or a vise to secure workpiece to keep the workpiece from rotating with the drill bit or cutting tool.

6. WARNING: For Your Own Safety — Don't wear gloves when operating a drill press.

# SETTING UP

The head and table of your drill press have been lowered on the column for convenience in packaging. To raise the head, proceed as follows:

1. Place a block of wood, about 7" long, between the drill press head and the table, as close to the column as possible.

2. Make sure the collar at the bottom of the raising mechanism rack is tight on the column and unlock the table clamp. Then loosen the nut located on the right hand side of the head, that locks the head to the column.

3. Turn the raising mechanism hand crank clockwise to raise the table and head simultaneously.

4. When the table approaches the top of the raising mechanism rack, lock the table and head to the column. Then loosen the raising mechanism collar and turn the raising mechanism hand crank counterclockwise. This will slide the rack of the raising mechanism further up the column.

5. Repeat STEPS 2, 3 and 4 until the top of the head is at the desired height. Be sure not to raise the top of the head casting beyond the top end of the column.

6. With the head and table still loose, visually line up the spindle with the center of the base and lock the head to the column. Make sure the safety collar is locked in place underneath the head.

7. Position the table and raising mechanism to the desired position on the column and lock them in place.

# MULTIPLE SPINDLE MODELS

In the case of multiple spindle models, the legs are not attached to the table, they are packed separately. To assemble the legs to multiple spindle models, carefully support machine on wooden horses or other temporary supports and bolt legs securely into position. The tables of multiple spindle models should be carefully leveled. Use a precision level on the table and place wedges under legs of the machine where required. Riser blocks, Cat. No. 50-400, one or two sets per leg, may be used if it is desired to have the table two or four inches higher.

# RAISING MECHANISM

All models are furnished with a rack and pinion type raising mechanism. The single spindle floor models use the unit in conjunction with the table, and all other models have it attached to the head.

If on single spindle floor models, a raising mechanism is desired in the head also, it will be necessary to purchase the 20-761 Accessory Head Raising Mechanism.

# CLEANING THE MACHINE

The table and all other machined or unpainted surfaces of the drill press are protected with a coating of rust preventive. This coating may be removed with a soft cloth moistened with kerosene (do not use acetone, gasolene or lacquer thinner for this purpose.) After cleaning, cover all unpainted surfaces with a light film of good machine oil.

# SELECTING FLOOR SPACE

Your Step Pulley Drilling Machine was completely assembled and tested at the factory. When selecting floor space, please note that vibration transmitted through inadequately constructed floors by adjacent machinery or other source can impair the accuracy of your machine. Refer to Fig. 2, for floor plan dimensions for the Series 2000 Drill Presses.

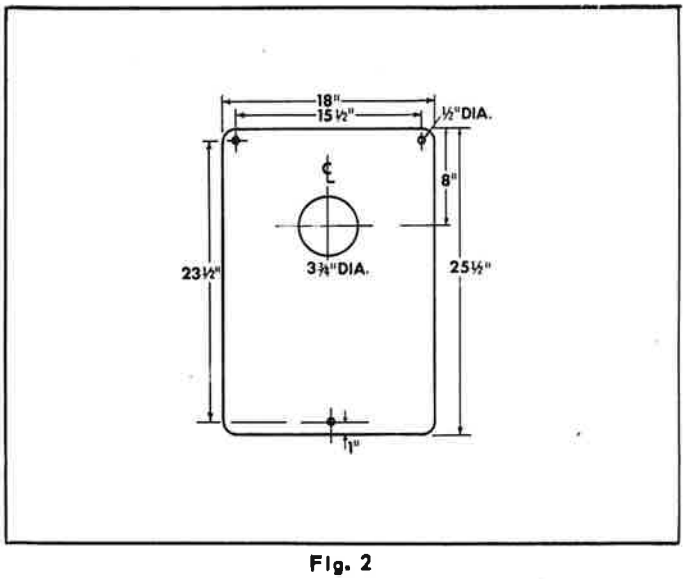


Fig. 2

# ELECTRICAL CONNECTIONS

If the motor on your machine is wired for 230V single phase, the power cord is equipped with a plug that has two flat, current-carrying prongs in tandem, and one round or "U"-shaped longer ground prong. This is used only with the proper mating 3-conductor grounding type receptacle, as shown in Fig. 3. When the three-prong plug on your machine is plugged into a grounded, 3-conductor receptacle, the long ground prong on the plug contacts first so the machine is properly grounded before electricity reaches it.

If the motor on your machine is wired for 200V, 230V or 460V three phase, the necessary wiring from the starter to the power source should be completed by a competent electrician.

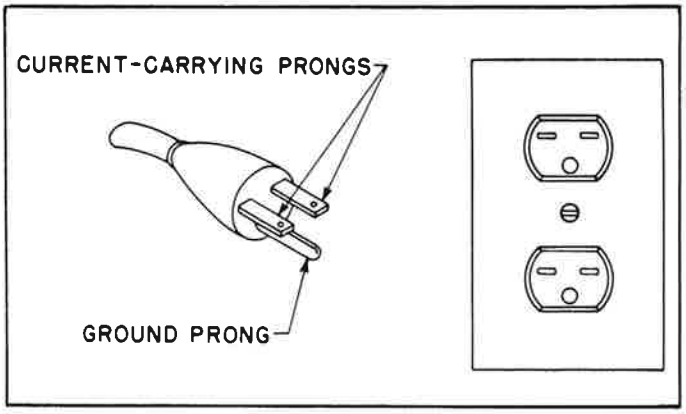


Fig. 3

IMPORTANT: Make sure the electrical characteristics are the same between the motor nameplate and the power source and make sure the power circuit the drill press will be used on is properly fused and that the wire size is correct, as shown in Fig. 4. MAKE SURE THE DRILL PRESS IS PROPERLY GROUNDED.

WIRE AND FUSE SIZE

| | SINGLE PHASE | | THREE PHASE | | | |
|---|---|---|---|---|---|---|
| | 230 VOLTS | | 200 - 230 VOLTS | | 460 VOLTS | |
| HP | WIRE SIZE | TIME LAG FUSE* | WIRE SIZE | TIME LAG FUSE* | WIRE SIZE | TIME LAG FUSE* |
| 1½ | 12 | 20 | 14 | 15 | 14 | 15 |

Fig. 4 *Size fuse selected for branch circuit protection.

# SPINDLE SPEEDS

With the Step Pulley Drilling Machine you get eight selected speeds with full HP at the spindle at all speeds.

The speeds available with the 2-to-1 Speed Reduction Model are 200, 300, 450, 650, 900, 1200, 1550 and 2000 RPM.

The speeds available with the 3-to-1 Speed Reduction Model are 125, 200, 300, 425, 600, 800, 1025 and 1250 RPM.

The highest speed is obtained when the belt is on the largest step of the motor pulley and the smallest step of the jackshaft pulley.

# CHANGING SPEEDS

When changing speeds on your drilling machine, proceed as follows:

1. DISCONNECT MACHINE FROM POWER SOURCE.

2. Loosen wing nut located on the opposite end of the plate (A) Fig. 5. The motor and motor plate can then be tilted forward, as shown in Fig. 5, releasing the belt tension.

3. Open the door (B) Fig. 5, tilt the motor pulley (C) forward, and move the belt to the desired steps on the motor and jackshaft pulleys, as shown in Fig. 5.

4. After the belt is positioned on the pulleys, close the door (B) Fig. 5, and tighten the wing nut located on the opposite end of the plate (A) to keep the motor pulley, motor and motor plate in the vertical position.

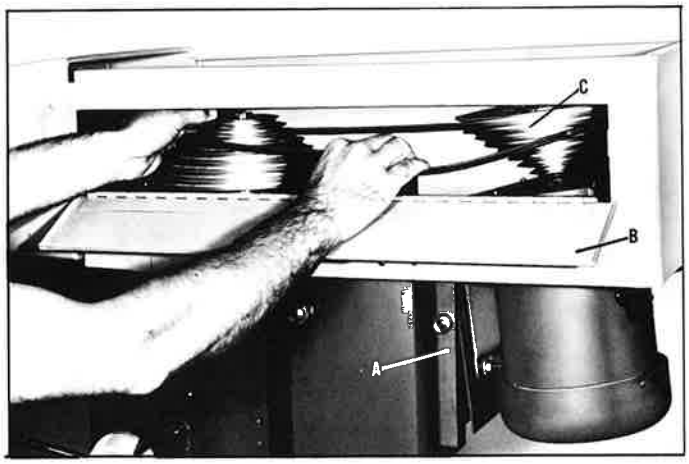


Fig. 5

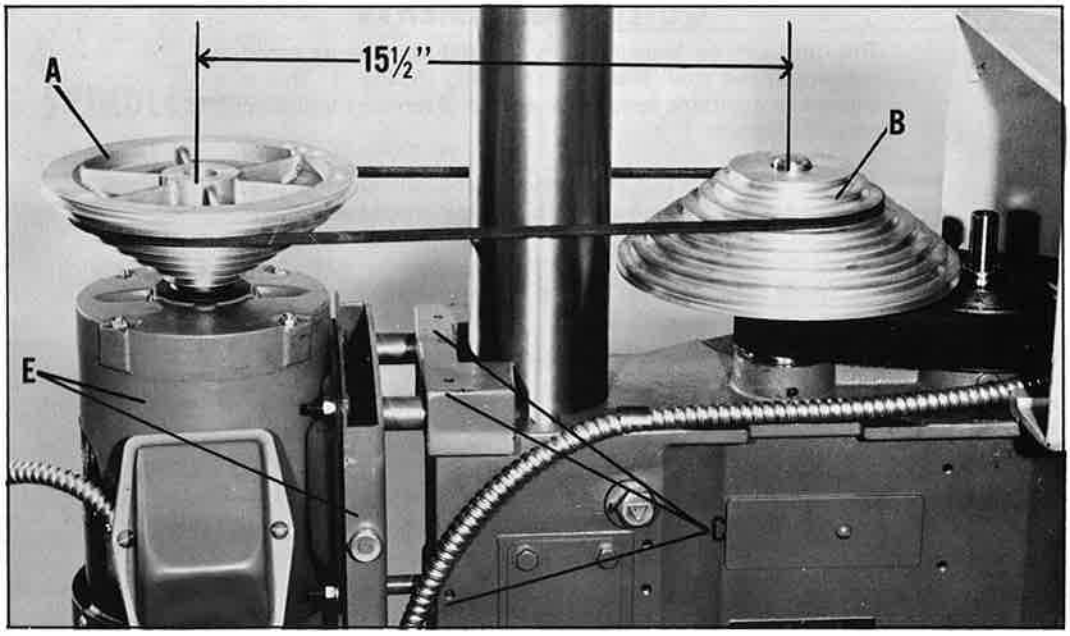


Fig. 6

## ADJUSTING BELT TENSION

The correct belt tension is determined by the center to center distance of the motor pulley (A) and the jackshaft pulley (B) Fig. 6. If it ever becomes necessary to adjust belt tension, proceed as follows:

1. Disconnect the machine from the power source.

2. Loosen the three screws (C) Fig. 6, and while making sure the motor pulley (A) is in parallel alignment with the jackshaft pulley (B), move the motor and motor plate (E) in or out until the center to center distance between the motor and jackshaft pulley is 15½", as shown in Fig. 6. NOTE: For clarity Fig. 6 is shown with the belt guard removed.

## ADJUSTING 1 ½" WIDE POLY "V" BELT TENSION

If it ever becomes necessary to adjust belt tension of the Poly "V" Belt (A) Fig. 7, simply loosen the two bolts located underneath the ledge (B) of the head casting and swivel the belt tensioning pulley (C) until the belt is tight.

Fig. 7

NOTE: On the 2-to-1 Speed Reduction Machine the two bolts that hold the belt tensioning idler bracket assembly are located at (A) as shown in Fig. 8. On the 3-to-1 Speed Reduction Machine these bolts will be located in the holes marked (B) Fig. 8.

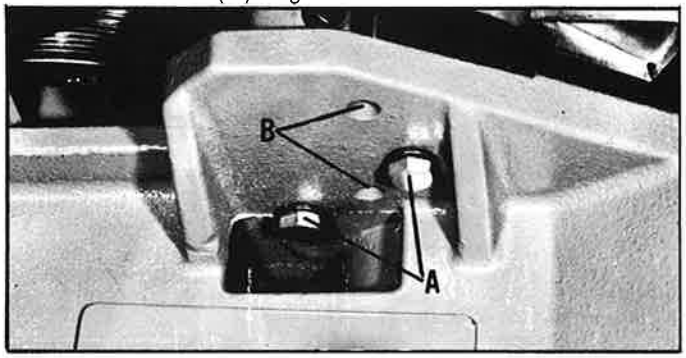


Fig. 8

# QUILL ADJUSTMENTS

The quill can be locked at any desired point in its travel, by tightening the quill locking hand knob (B) Fig. 9. This is an especially desirable feature for set-up of tooling for production type operations.

After considerable use, play may develop between the quill and the head casting due to wear. To compensate for wear between the quill and head, proceed as follows:

1. Make sure the quill locking hand knob (B) Fig. 9, is loose.

2. Remove two screws and washers (E) Fig. 9. Only one of the screws and washers (E) can be seen in Fig. 9. The other screw and washer is located on the left front side of the head casting.

3. Tighten the two quill adjusting screws which are located directly underneath the two screws and washers (E) Fig. 9. It is not necessary to tighten these screws too much.

4. Rotate pilot wheel to test movement of quill. If there is a slight "drag", quill adjusting screws have been adjusted too tight. Back off quill adjusting screws slightly. If the quill still has play, slightly tighten quill adjusting screws.

5. After proper adjustment has been made, replace screws and washers (E) Fig. 9.

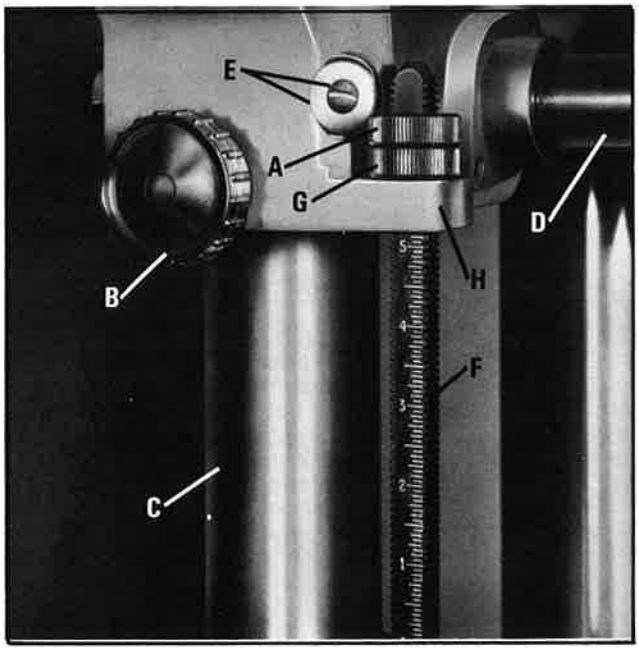


Fig. 9

# DRILLING HOLES TO DEPTH

When drilling one or two holes to a predetermined depth, the calibrations on the face of the depth stop rod (F) Fig. 9, can be used.

Where a number of holes are to be drilled to exactly the same depth, the stop nuts (A) and (G) Fig. 9, on the threaded stop rod (F) are used. After the first hole has been drilled to depth, the lower stop nut (G) is set against the lug (H) on the head through which the stop rod passes. Return the quill to the up position and tighten the upper stop nut (A) against the lower stop nut and all subsequent holes will be drilled to exactly the same depth.

# ADJUSTING SPINDLE RETURN SPRING

For the purpose of automatically returning spindle upward after a hole has been drilled, a spring is provided enclosed in a case and is located on the left side of the drill press head. This spring has been adjusted at the factory and should not be disturbed unless absolutely necessary. If it should become necessary to adjust it, proceed as follows:

1. Remove the depth stop nut (G) and locking sleeve (A) Fig. 9, and make sure the quill locking handle (B) is loose.

2. Rotate the pilot wheel and lower the quill (C) Fig. 9, until the rack on the back of the quill disengages with the pinion shaft (D). A special design is incorporated into the quill to prevent it from dropping out of the head casting.

3. When the quill (C) Fig. 9, is lowered as far as possible, turn the pilot wheel counterclockwise to increase or clockwise to decrease the return spring tension.

4. When the desired tension is obtained push up the quill (C) until it engages with the pinion shaft (D) Fig. 9, The spring tension will then return the quill to the up position.

5. Replace the depth stop nut (G) and locking sleeve (A) Fig. 9.

# CHANGING SPINDLES

To change the spindle for any reason, proceed as follows:

1. Remove the two nuts and washer (A) Fig. 10.

2. Carefully pull out the return spring and housing (B) Fig. 10; about 1/4" until roll pin (C) disengages with the groove in the return spring housing and carefully rotate the return spring housing to release tension on the return spring or refer to the instructions on page 5 under ADJUSTING SPINDLE RETURN SPRING to release spring tension.

3. Disengage the return spring from the screw (D) Fig. 10, in the pinion shaft, and remove the return spring and housing from the pinion shaft.

4. Loosen screw (E) Fig. 10, and move retainer (F) up out of the groove (G) in the pinion shaft.

5. Remove screw (D) Fig. 10, from pinion shaft and while holding the quill with your left hand, remove the pinion shaft (H) by pulling it straight out. The quill assembly can then be easily removed from the head casting.

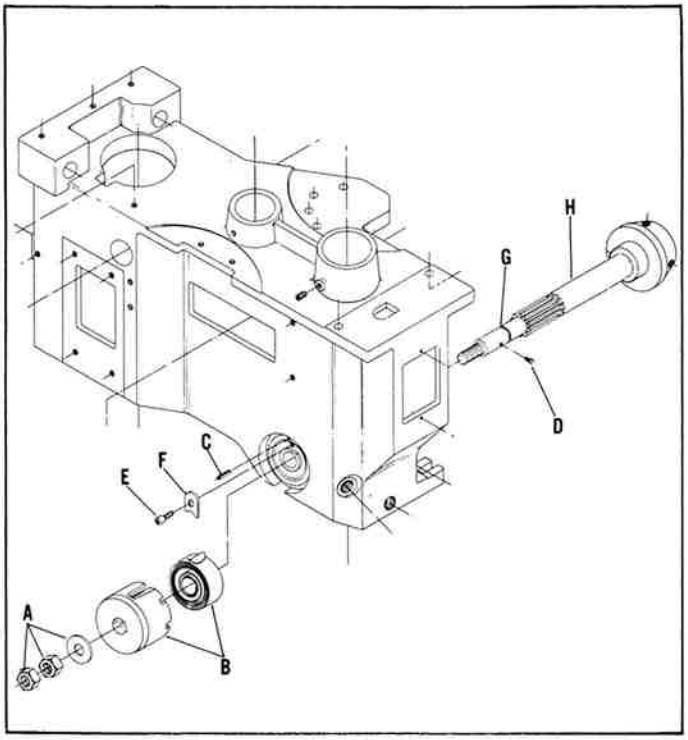


Fig. 10

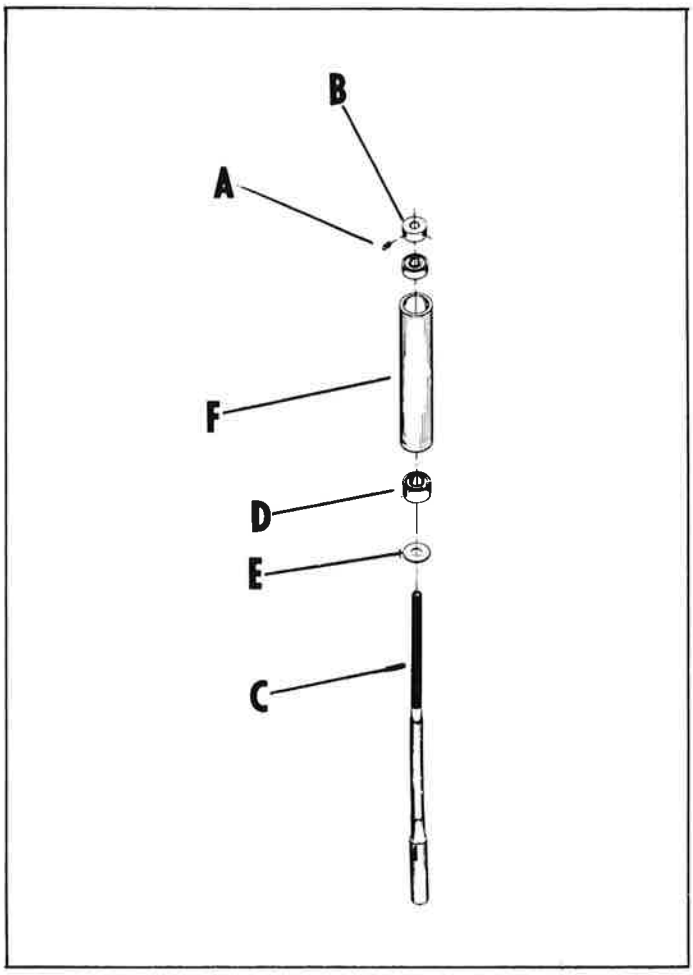


Fig. 11

6. Loosen the two set screws (A) in collar (B) Fig. 11; and remove collar.

7. With a hard rubber mallet, tap spline end of spindle (C). The spindle (C) with bearing (D) and flinger collar (E) will come out of the quill (F) Fig. 11.

8. Using an arbor press, remove bearing (D) and flinger collar (E) from spindle (C) Fig. 11.

9. To replace spindle, reverse above procedure making sure the bearing (D) and flinger collar (E) have been pressed tight against the shoulder on the spindle (C) Fig. 11, before replacing spindle in quill.

10. After replacing collar with set screws (A & B) Fig. 11, on the spindle, be sure there is not end play between spindle and quill. Play is eliminated by seating both bearings in quill.

11. When replacing quill in head casting, rotate spindle if necessary to engage spline in pulley.

12. After the quill is replaced, adjust the spindle return spring.

# PARTS DISTRIBUTION CENTERS FOR DELTA INTERNATIONAL MACHINERY

Even quality built equipment such as the Delta machine you have purchased, may require occasional replacement parts to maintain it in good working condition over the years. To order replacement parts, write or call one of the following Delta Parts Distribution Centers:

**Van Nuys, CA 91406**
**16259 Stagg Street**
**Phone: (818)989-1242**

**Memphis, TN 38118**
**4290 Raines Road**
**Phone: (901)363-8800**

Always include the following information:

1. Model No. and Serial No. and all specifications shown on the Model No./Serial No. plate

2. Part number or numbers as shown in the Replacement Parts list supplied with your Delta machine.

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**Delta Machinery**
**One Year Limited Warranty**

**Delta Machinery will repair or replace, at its expense and at its option, any Delta machine, machine part, or machine accessory which in normal use has proven to be defective in workmanship or material, provided that the customer notifies his supplying distributor of the alleged defect within one year from the date of delivery to him, of the product and provides Delta Machinery with reasonable opportunity to verify the defect by inspection. Delta Machinery may require that electric motors be returned prepaid to the supplying distributor or authorized service center for inspection and repair or replacement. Delta Machinery will not be responsible for any asserted defect which has resulted from misuse, abuse or repair or alternation made or specifically authorized by anyone other than an authorized Delta service facility or representative. Under no circumstances will Delta Machinery be liable for incidental or consequential damages resulting from defective products. This warranty is Delta Machinery's sole warranty and sets forth the customer's exclusive remedy, with respect to defective products; all other warranties, express or implied, whether of merchantability, fitness for purpose, or otherwise, are expressly disclaimed by Delta.**

Part No. 400-06-652-5002